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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/467,992 | 12/20/1999 | LEONARD FORBES | 303.389US2 | 3099 |
| 21186 | 7590 | 06/27/2005 | EXAMINER | |
| SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402-0938 | | | LEE, EUGENE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2815 | |

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|------------------------------|------------------------|---------------------|
| | 09/467,992 | FORBES ET AL. |
| Examiner | Art Unit | |
| Eugene Lee | 2815 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 11 April 2005.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 17-19, 22, 23, 25-27, 29, 31, 32, 34-37, 39-48, 50, 52 and 53 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 31, 32, 37 and 48 is/are allowed.

6) Claim(s) 17-19, 22, 23, 25-27, 29, 34-36, 39-47, 50, 52 and 53 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/11/05 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 17 thru 19, 22, 23, 25 thru 27, 29, 34, 35, 36, 39 thru 47, 50, 52, and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what the applicant is referring to (see, for example, line 6 of claim 17, and line 5 of claim 52) in the limitations “integral” and “integrally”. On page 6, lines 26-28 of the specification, the applicant mentions the word “integral”; however, the specification still does not clearly define the meaning of the word “integral” as disclosed in the claims.

It is unclear what the applicant is referring to (see, for example, line 6 of claim 17) in the limitation “conductorless electrical connection”. On page 6, line 28 through page 7, line 1 of the specification, the applicant states “there is no need for a contact between second source/drain region 110 and capacitor 119”; however, this is not the same as a conductorless electrical

connection since the source/drain region and the capacitor are conductors that can provide an electrical connection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Insofar as definite, claims 17 thru 19, 22, 23, 25, 34, 39, 41 thru 46, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh 4,920,389 in view of Kanetaki et al. 4,906,590. Itoh discloses (see, for example, FIG_ 8(k)) a memory cell array structure comprising memory cells wherein an individual memory cell comprises bit lines 222, word lines 234, a low electric resistance region (first source/drain region) 232, high electric resistance semiconductor layer (body region) 204, low electric resistance semiconductor layer (second source/drain region) 202, highly electroconductive layer (second plate) 216 and gate 234. In column 13, lines 18-32, Itoh discloses the low electric resistance semiconductor layer 202 serving as a first electrode (first plate) of a capacitor as well as a source region. In column 10, lines 31-41, Itoh discloses the highly electroconductive layer comprising polycrystalline silicon. Itoh does not disclose an etch-roughened surface. However, Kanetaki discloses (see, for example, FIG. 2) a trench capacitor containing two plurality of hollows (roughened surfaces). In column 1, lines 11- *, Kanetaki states that the plurality of hollows increases the electrode area without increasing the planar area. Therefore, it would have been obvious to one of ordinary

skill in the art at the time of invention to include the plurality of hollows (roughened surfaces) in Itoh's invention in order to increase the electrode area without increasing the planar area.

Regarding claim 52 and the limitation "word line", see FIG_8(k) wherein Itoh discloses a gate electrode (word line) 234.

Regarding claim 53 and the limitation "plurality of bit lines", see FIG_8(k) wherein Itoh discloses bit lines 222.

6. Claims 26, 27, 29, 35, 36, 40, 47, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh '389 in view of Kanetaki et al. '590 as applied to claims 17-19, 22, 23, 25, 31, 32, 34, 37, 39, 41 thru 46, 48, 52, and 53 above, and further in view of Wahlstrom 5,396,452. Itoh in view of Kanetaki does not disclose a row decoder and column decoder so as to selectively access the cells of an array. However, Wahlstrom discloses (see, for example, FIG. 2) a dynamic random access memory comprising memory cells arranged in an array wherein word lines (WL) are arranged orthogonal to bit lines (BL). In FIG. 1, Wahlstrom shows a row decoder and a column decoder which access the memory cells according to the row and column addresses applied. It would have been obvious to one of ordinary skill in the art at the time of invention to have a column and row decoder in order to form a memory cell array wherein the individual memory cells may be accessed easily.

Allowable Subject Matter

7. Claims 31, 32, 37, and 48 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The references of record, either singularly or in

combination, do not teach or suggest at least a memory cell, comprising: a transistor,; a trench capacitor including a first plate coupled to the second source/drain region without an intervening conductor; and the transistor further includes a gate adjacent to the body region and the gate being directly above the polysilicon second plate.

Response to Arguments

8. Applicant's arguments with respect to claims 17-19, 22, 23, 25-27, 29, 31, 32, 34-37, 39-48, 50, 52, and 53 have been considered but are moot in view of the new ground(s) of rejection.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eugene Lee

June 17, 2005